



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Alternative Fuels as a Path to Energy Security

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Our Energy Infrastructure Faces a Broad Spectrum of Threats

- **Physical** – Terrorism, natural disasters, accidents, global warming, and aging infrastructure
- **Cyber** – Malicious intrusion and inadvertent error
- **System complexity**– Cascading effects, critical nodes, and interdependencies



Our Energy Infrastructure is Difficult to Protect

- 158,000 miles of main electric transmission lines
- 5,000 power plants (totaling 800,000 megawatts)
- 2,000,000 miles of oil pipelines
- 1,300,000 miles of gas pipelines
- 2,000 petroleum terminals
- 1,000,000 gas and oil wells
- 150 oil refineries
- 300 tankers (ships)
- Plus much, much more!



Our Imported Fuels - Oil

- 10.9 million bbl/day (55% of our 2001 daily consumption)
- 2/3 used by transportation sector
- Imports expected to reach 65% by 2025
- 86% of increase for transportation

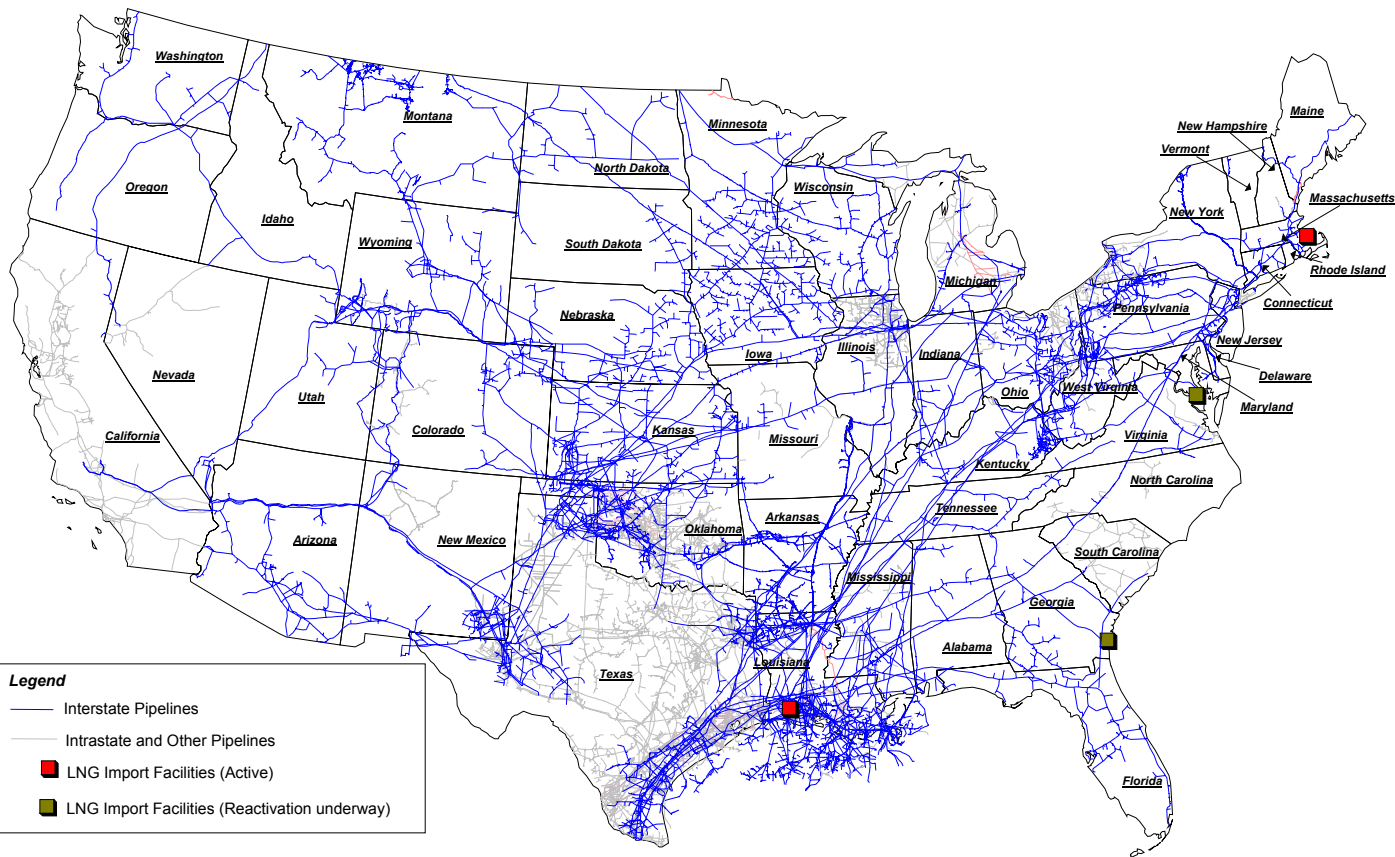


Other Imported Fuels

- Imported natural gas accounted for 15% of total consumption in 2001
- Annual natural gas consumption to double from 5.3 tcf in 2001 to 10.6 tcf in 2025, mostly for power generation
- Electricity imports 1% of total in 2001; expected to decrease 67% by 2025

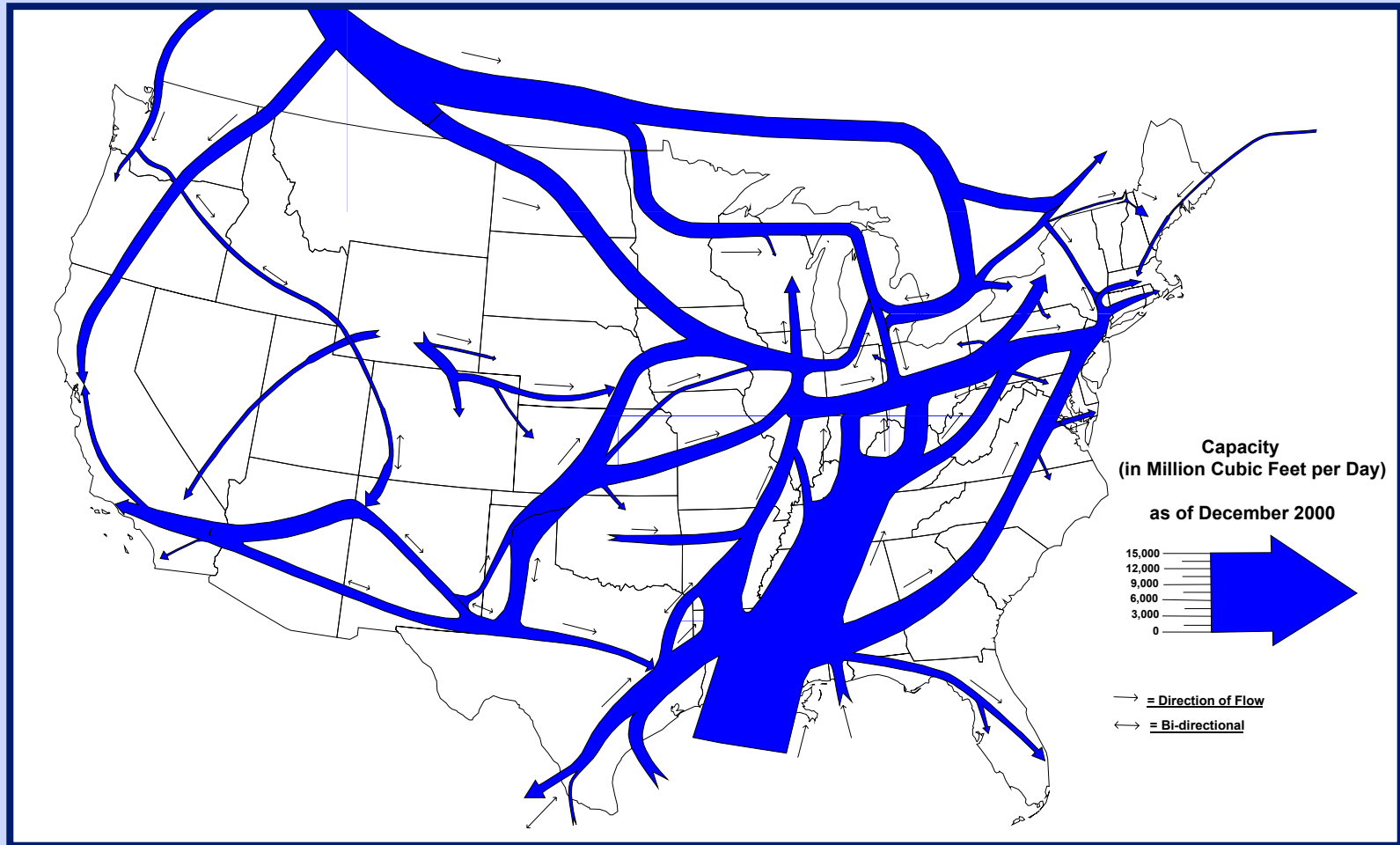


U.S. Natural Gas Pipeline Systems and Liquefied Natural Gas Import Facilities 2001





Natural Gas Pipeline Capacity Serving the U.S. Marketplace





The Key to a Robust Energy Infrastructure

- Reduced dependence on imported fuels
- Distributed generation
- “Smart systems”
- Resiliency
- Diversification



Domestically Produced Fuels

- Could reduce dependence on imported fuels
- Domestically produced fuels, including oil and natural gas, would reduce security concerns associated with shipping, unloading, storage and distribution



Alternative Fuels Provide Energy Security





Alternative Fuels

- Could reduce complexity, and increase reliability and resiliency of domestic energy infrastructure, enhancing security
- Could reduce air pollution
- Development needs to consider infrastructure impacts, e.g., storage and distribution to maximize benefits



Distributed, Renewable Power Sources Also Provide Energy Security for Cities





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